

Amendments to the Claims.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A member for air motors in which the surface thereof, having a complex shape,

is heated at 450 to 580°C in a mixed gas atmosphere comprising 50 to 95% of hydrogen, and 5-50% of nitrogen and hydrogen sulfide,

a DC voltage at 300 to 500V is applied relative to an anode

disposed in a vacuum chamber under reduced pressure and

a nitrosulphurization layer having a substantially uniform thickness of about 30-300 μm is formed on the surface, with a Vickers hardness of 800-1200,

by using a bright nitrogen diffusion method, and wherein said member is at least one of a rotor, cylinder, a front cylinder cover, and a rear cylinder cover;

and

wherein any difference of Vickers hardness value between the mean value and either the maximum value or the minimum value is no greater than 100.

2. (Previously Amended) A member for air motors as defined in claim 1, wherein the nitrosulphurization layer at the uppermost surface of the member has a mean Vickers hardness of about 1100.

3. (Original) A member for air motors as defined in claim 1, wherein the ratio between the nitrogen sulfide in the gas mixture is from 0.01 to 99 parts by volume of the hydrogen sulfide content based on 100 parts by volume of the nitrogen content.

4. (Previously Presented) A member for air motors as defined in claim 1, wherein the member is two or more of the rotor, cylinder, and front cylinder cover and the rear cylinder cover.

5. (Previously Presented) A member for air motors as defined in claim 2, wherein the ratio between the nitrogen sulfide in the gas mixture is from 0.01 to 99 parts by volume of the hydrogen sulfide content based on 100 parts by volume of the nitrogen content.

6. (Previously Presented) The member of claim 5, wherein said surface comprises a quenched and tempered die steel.

7. (Previously Presented) The member of claim 5,
wherein the inside of the vacuum chamber is evacuated to about
 10^{-3} torr.

8. (Previously Presented) The member of claim 7,
wherein said nitrosulphurization layer is formed over 1-30
hours.

9. (Previously Presented) The member according to
claim 5, wherein the N₂/H₂ volume ratio is 1:10 to 2:1.

10. (Previously Presented) The member of claim 9
wherein the mixed gas atmosphere also contains an inert gas.

11. (Previously Presented) The member of claim 10,
wherein the voltage is 380-460 V, the hydrogen partial
pressure is 80, the hydrogen sulfide partial pressure is 5-15,
and the nitrogen partial pressure is 15-5.

12. (Currently Amended) The A member according to
~~claim 11, for air motors in which the surface thereof, having~~
a complex shape,

is heated at 450 to 580°C in a mixed gas atmosphere
comprising 50 to 95% of hydrogen, and 5-50% of nitrogen and
hydrogen sulfide,

a DC voltage at 300 to 500V is applied relative to
an anode

disposed in a vacuum chamber under reduced pressure
and

a nitrosulphurization layer having a substantially
uniform thickness of about 30-300 μm is formed on the surface,
with a Vickers hardness of 800-1200,

by using a bright nitrogen diffusion method,
wherein said member is at least one of a rotor,
cylinder, a front cylinder cover, and a rear cylinder cover;
and

wherein the surface is heated along a heating cycle comprising raising the temperature to about 480°C over about one hour during which evacuation is conducted with no gas supply;

then maintaining said temperature of approximately 480°C in the presence of hydrogen gas without nitrogen or hydrogen sulfide;

then adding nitrogen and hydrogen sulfide to provide a gas mixture of approximately 80% hydrogen, 10% nitrogen, and 10% hydrogen sulfide and applying said DC voltage; and

then reducing the temperature over a period of about four hours in a nitrogen atmosphere substantially free of hydrogen and hydrogen sulfide, and

the resultant nitrosulphurization layer has a thickness of about 0.14 mm and a surface Vickers hardness varying between 1080 and 1150.

13. (Previously Presented) An air motor comprising a rotor (2) supported by bearings (7, 8) fitted to a front cylindrical cover (5) and a rear cylindrical cover (6) disposed about said rotor (2); a cylinder (4) disposed within said front cylindrical cover (5) and rear cylindrical cover (6) and disposed about said rotor (2) with a partial annular space (11) defined between said rotor (2) and said cylinder (4); means for feeding air to the space between the rotor (2) and the cylinder (4) and means for exhausting air from the space between the rotor (2) and the cylinder (4); and wherein at least the inner wall of said cylinder (4) comprises the member of claim 1.

14. (New) The member of claim 1 wherein the nitrosulfurization layer extends to a depth of 0.09 mm.

15. (New) The member of claim 1 wherein said Vickers hardness is 700 or more under a load of 100 gf, said hardness extending to a depth of 0.09 mm.

16. (New) The member of claim 1 wherein the hardness of the nitrosulfurization layer continuously decreases from a maximum on said surface to a depth of 0.14mm.

17. (New) A member for air motors in which the surface thereof, having a complex shape, is heated at 450 to 580°C in a mixed gas atmosphere comprising 50 to 95% of hydrogen, and 5-50% of nitrogen and hydrogen sulfide,

a DC voltage at 300 to 500V is applied relative to an anode

disposed in a vacuum chamber under reduced pressure and

a nitrosulphurization layer having a substantially uniform thickness of about 30-300 μm is formed on the surface, with a Vickers hardness of 800-1200,

by using a bright nitrogen diffusion method,

wherein said member is at least one of a rotor, cylinder, a front cylinder cover, and a rear cylinder cover; and

wherein the nitrosulfurization layer extends to a depth of 0.09 mm.

18. (New) A member for air motors in which the surface thereof, having a complex shape,

is heated at 450 to 580°C in a mixed gas atmosphere comprising 50 to 95% of hydrogen, and 5-50% of nitrogen and hydrogen sulfide,

a DC voltage at 300 to 500V is applied relative to
an anode

disposed in a vacuum chamber under reduced pressure
and

a nitrosulphurization layer having a substantially
uniform thickness of about 30-300 μm is formed on the surface,
with a Vickers hardness of 800-1200,

by using a bright nitrogen diffusion method,
wherein said member is at least one of a rotor,
cylinder, a front cylinder cover, and a rear cylinder cover;
and

wherein said Vickers hardness is 700 or more under a
load of 100 gf, said hardness extending to a depth of 0.09 mm.

19. (New) A member for air motors in which the
surface thereof, having a complex shape,
is heated at 450 to 580°C in a mixed gas atmosphere
comprising 50 to 95% of hydrogen, and 5-50% of nitrogen and
hydrogen sulfide,

a DC voltage at 300 to 500V is applied relative to
an anode

disposed in a vacuum chamber under reduced pressure
and

a nitrosulphurization layer having a substantially uniform thickness of about 30-300 μm is formed on the surface, with a Vickers hardness of 800-1200,

by using a bright nitrogen diffusion method,
wherein said member is at least one of a rotor,
cylinder, a front cylinder cover, and a rear cylinder cover;
and

wherein the hardness of the nitrosulfurication layer continuously decreases from a maximum on said surface to a depth of 0.14mm.